VoDSL

Voice over DSL
Overview

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- Introduction VoDSL
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- VoMPLS
Developed in 1989, designed primarily for video

- ADSL was the first type ("high downstream" for Video)

When DSL was first developed in 1989 it was designed primarily for video. ADSL was the connection of choice because it provided the high downstream rates that were needed for streaming video. Video on Demand (VOD) was viewed as the next generation service supporting the next generation network from telephone companies around the world. Video on Demand was expected to be the telephone company's way of competing with cable television providers, and ADSL was the technology to make it possible. However, with few exceptions, VOD has not proven to be as popular as was once predicted.
Introduction DSL

- Digital Subscriber Line
- Provides high speed Internet access through existing telephone lines (copper lines).
- Internet access and phone calls can be done simultaneously
- No dial-up procedure before internet access
- Many different DSL Occurrences (xDSL):
  
  \[
  \text{ADSL, H(igh Data Rate)DSL, V(ery High data Rate)DSL, S(ymmetric)DSL...}
  \]
Introduction VoDSL

• Means Voice over Digital Subscriber Line (DSL)
  
• multiple telephone lines and high speed data services over a single access line.
  
• dynamic sharing of the DSL bandwidth between voice calls and data services.
  
• Provides the ability to purchase voice and data services from a single provider
Requirements (VoDSL)

- Reliability
- Quality
  - Digitalisation, Compression should not be noticeable (hearable)
- Feature Support
  - Caller ID, Call Waiting, Voice Messages, DTMF tones etc.
- Support of existing Customer Equipment
  - Analog Phones (tone- and pulsdialing)
  - Fax and Modems etc.
- Scalability
DSL - Growth

• Last year increase – December 2002 to December 2003
  • 27.94 Millionen

• Global Subscribers Reach 63.8 million – March 2, 2004
DSL - Growth

- 1999: 882,000
- 2000: 7,768,900
- 2001: 18,813,700
- 2002: 35,897,700
- 2003: 63,840,000
## DSL - Growth

<table>
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<tr>
<th>Global Ranking</th>
<th>Country</th>
<th>DSL Subscribers 31 December 2003</th>
<th>DSL per 100 phone lines 31 December 2003</th>
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<td>1</td>
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DSL - Growth

- competitive local exchange carrier
  - Telecommunications Act: The Act allows companies with CLEC status to use ILEC infrastructure

- incumbent local exchange carrier
  - telephone company that was providing local service when the Telecommunications Act was enacted
Architecture

• The architecture defines three main components:
  • Integrated Access Device (IAD)
  • DSL Access Multiplexer (DSLAM)
  • Voice Gateway
Customer Voice and Data traffic is combined on a single Digital Subscriber Line via an Integrated Access Device (IAD).

Traffic from many customers is concentrated in the Central Office or other traffic aggregation point.

Voice traffic is sent to the PSTN (public switched telephone network) through a Voice Gateway.

Voice Switch Center

Central Office

DSLAM

DSL

IAD

Customer Premise

PBX

Telephone

Fax

Customer Voice and Data traffic is combined on a single Digital Subscriber Line via an Integrated Access Device (IAD).
Architecture

- DSL Forum VoDSL Models:
  - Broadband Loop Emulation Service (BLES)
  - Voice over Broadband Networks (VoMBN)
DSL Forum BLES Model

CPE: Customer premise equipment
Broadband Loop Emulation Service

• Attaches to the Class 5 switch using well-known and proven standard interfaces
  • VoDSL Systems transparently derive voice services from Class 5
    • Dial tone, Voice Mail,
    • Caller ID, Call wait, Call forwarding,…

• Allocates bandwidth dynamically
  • Voice calls are given priority
  • Data calls using remaining bandwidth
Voice over Broadband Networks

- Using softswitch technology to deliver value-added services over DSL at the network edge.

- Class 5 switching architecture is expensive, and limits the ability of service providers to differentiate.

- MBN will support end-to-end data network connectivity for voice calls.
Voice over
Broadband Networks

- What are Broadband Networks?
  - Networks which carry multiservice traffic
  - (Other terms are Integrated Networks or Multiservice Networks)

- What is multiservice traffic?
  - Anything which can be encoded in bits
    - Audio e.g. Voice
    - Video e.g. HDTV pictures
    - Data e.g. File transfer
Voice over Broadband Networks

• The advantages of this architecture are:

  • provide IP-based enhanced services
  • all call protocols are provided outside a Class 5 switch
  • equipment at subscriber is very much like that for BLES
VoDSL Architecture - VoMBN
VeDSL
Use one of ADSL Channels as Voice Channel

PCM voice channel (64Kbps)

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CVoDSL
VeDSL vs. VoDSL

VoDSL (Broadband Loop Emulation Service)
- Echo Canceller
- Compression
- Codec
- SLIC

VeDSL (Voice Enabled DSL)
- Codec
- SLIC
- ADSL Phy

To DSLAM
The term “Voice over MPLS” (VoMPLS) defines a method to transport encoded voice directly over MPLS. Voice samples are encapsulated in the MPLS protocol.
VoMPLS

- VoMPLS Benefits
  - Efficient transport mechanism for packetised voice by reducing header overhead.
  - Support of efficient multiplexing of multiple voice calls over a single LSP
  - Usage of label switched paths as a bearer capability to provide predictable and constrained QoS
VoMPLS Reference Architecture
THANK YOU!!